Chapter 3.41
Mobile Banking Systems and Technologies

Cheon-Pyo Lee
Mississippi State University, USA

Merrill Warkentin
Mississippi State University, USA

INTRODUCTION

The last decade has witnessed the rapid growth of mobile communication devices and wireless technologies across the globe. The convergence of mobile devices and wireless technologies has not only changed the way many activities are conducted, but has also provided a foundation for a new type of technology-aided commerce called mobile commerce (m-commerce). As e-commerce's next evolutionary stage, m-commerce opens up new business opportunities in business-to-consumer (B2C) markets in addition to extending current operations in e-commerce and traditional brick-and-mortar businesses (Varshney & Vetter, 2002). The significant power of m-commerce is primarily a result of the anytime-anywhere connectivity of wireless devices, which provides unique experiences and services (Figge, 2004; Zwass, 2003).

One of the most promising and value-added m-commerce services is mobile banking (Lee, McGoldrick, Keeling, & Doherty, 2003; Mallat, Rossi, & Tuunainen, 2004). Mobile banking is the newest electronic delivery channel to be offered by banks in which technology has become an increasingly vital element, and it provides convenience and enhanced value to both banks and customers. With its clear benefits, mobile banking is now gaining rapid popularity in European and Asian countries with the significant market penetration of mobile handsets and the optimally designed marketing tactics of service providers (Suoranta & Mattila, 2004). However, mobile banking is still marginally adopted across the globe, and especially in the U.S., the growth appears much slower than anticipated (Mallat et al., 2004). In the United States, there are only a small number of banks that have actually introduced mobile banking services, and most other mobile banking efforts are in small-scale trials (Charny, 2001). Therefore, the technology which will be employed in the United States market has been of interest not only to financial institutions, but also to mobile technology developers and future users.

BACKGROUND

M-commerce is defined as any transaction with a monetary value—either direct or indirect—that is conducted over a wireless telecommunication network (Barnes, 2002). However, there is no clear definition for mobile banking services, so often the traditional banking services using mobile handsets (i.e., making transaction by calling a call center using a mobile phone) are considered as mobile banking services. Thus, it is very important to define a clear boundary of mobile banking service to avoid confusion. In this article, mobile banking refers to a client-server system that is specifically designed for mobile devices, allowing banking customers to use handheld devices to access their accounts, pay bills, authorize fund transfers, or perform other activities. Table 1 shows various mobile banking services currently provided.

Mobile banking has two big advantages over the narrow sense of e-banking: security and convenience (Herzberg, 2003). E-banking is based on account-holder authentication by the payment system which can fail in multiple ways but do not distinguish the source of fraud. However, mobile devices, usually with a built-in display and keyboard, are well positioned to provide a technical solution for reducing fraud and allowing the fair allocation of responsibility for damages from fraud. In addition, unlike e-banking, the transactions through mobile banking can be made anywhere whether on foot or in cars, planes, or trains.

Mobile banking services began in 1999 in European and Asian countries, and have gained rapid popularity with the significant market penetration of mobile phones, the optimally designed marketing tactics of service providers, and the increased exposure to mobile technology (Suoranta & Mattila, 2004). Like many other mobile commerce services, mobile banking services are provided by several different entities, with which the customers of mobile banking services must interact to complete a successful mobile banking transaction, especially the mobile device provider, mobile operator, and content provider (Varshney & Vetter, 2002; see Figure 1). Thus, each entity in the mobile banking cycle must assist the others to attract more customers to mobile banking. The fastest way to promote the growth of mobile

Table 1. Mobile banking services

- Check the balances of checking and savings accounts, investment account, business banking accounts, lines of credit, credit card accounts, and loan and mortgage accounts
- Electronic funds transfer (EFT)
- Pay bills and taxes
- Request a check book
- Inquire about check status
- Customize the statements according to the user's specific needs and requirements